

36 England's Lane, London

Plant Noise Assessment

Report 206/0332/R2

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Attachments

Glossary of Acoustic Terms

206/0332/F1

Figure showing the site location, measurement position and assessment position.

206/0332/TH01

Time history illustrating the results of the unattended noise survey.

206/0332/PNS1

Plant noise schedule.

206/0332/CS1

Plant noise assessment position summaries.

 End of Section



Plant Noise Assessment

1 Introduction

- 1.1 It is proposed to install mechanical services plant as part of the in-fill of the existing rear light well 36 England's Lane, London NW3 4UE.
- 1.2 This report provides details of a noise survey undertaken on site to determine the current noise climate and the corresponding plant noise emission limits to the nearest noise sensitive receptors.
- 1.3 This report details the calculation of noise emissions from the proposed plant to the nearest noise sensitive receptors and details any mitigation where necessary.

2 Site Description

- 2.1 The site is located at 36 England's Lane, London, NW3. The site and its surrounds are illustrated on the attached site plan 206/0332/F1.
- 2.2 The site is immediately bounded by Elizabeth Mews to the north of the property, with Primrose Gardens beyond; both of which are quiet residential roads. Belsize Park Gardens, Primrose Hill and Eton Avenue lie to the west and south west of the property, all of which see frequent traffic with occasional queuing at their shared intersection.
- 2.3 On England's Lane, the site is surrounded by a predominantly four storey mixed use terrace featuring commercial properties such as restaurants on the ground floor and a mix of office space and residential properties on the upper floors.
- 2.4 The site itself consists of a gym at ground and basement floor levels and residential properties within the above ground levels. A lightwell to the basement level is located at the rear of the property which houses the existing plant.
- 2.5 The site is within the jurisdiction of the London Borough of Camden.

3 Environmental Noise Survey

3.1 Methodology & Instrumentation

- 3.1.1 An unattended noise survey was undertaken at the site between 1400 hours on Wednesday 30th June and 1400 hours on Thursday 1st July 2021.
- 3.1.2 Measurements of the noise levels were taken from a single measurement position indicated as MP1 on the attached site plan 206/0332/F1 and described below:
 - MP1: free-field measurement position in the centre of the rear light well of the site, approximately 4 m above basement level and 2m from the façade.



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- 3.1.3 Measurements of L_{Aeq} , L_{A90} , L_{Amax} were recorded over consecutive 15-minute periods (see Glossary of Acoustic Terms for an explanation of the noise units used) for the duration of the survey using the equipment listed within table T1 below.

Item	Manufacturer	Type
Sound Level Analyser	Norsonic	140
Acoustic Calibrator	Norsonic	1251
Weatherproof windshield	Norsonic	1212

T1 Equipment used during unattended noise survey.

- 3.1.4 The microphone was enclosed within a weatherproof windshield and the sound level meter was calibrated before and after the survey to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.
- 3.1.5 The weather conditions when setting up the equipment were overcast and still with no rain and on collection were sunny and still. It is understood that weather conditions throughout the survey were suitable for noise measurements.

3.2 Results

- 3.2.1 The results of the noise survey measurements are presented in the attached time-history graph 206/0332/TH01.
- 3.2.2 The measured background noise levels derived following guidance in BS 4142:2014+A1:2019¹ can be seen in table T2 below.

Location	Representative Measured Background Noise Level, dB(A)	
	Daytime (0700-1900)	Night time (2300-0700)
MP1: 36 England's Lane lightwell	36	31

T2 Representative measured background noise levels, $L_{A90,15min}$.

¹ British Standard BS4142:2014 - Methods for rating and assessing industrial and commercial sound



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- 3.2.3 The noise climate at the front of the site was dominated by road noise from England's Lane. The noise climate to the rear of the site was dominated by existing plant from various locations surrounding the site and road noise mainly from Belsize Park Road and England's Lane

4 Noise Emission Criteria

4.1 Local Authority Criteria

- 4.1 Policy A4 of the London Borough of Camden's *Local Plan 2017* relates specifically to noise:

'We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity.'

Planning conditions will be imposed to require that plant and equipment which may be a source of noise is kept working efficiently and within the required noise limits and time restrictions.

Conditions may also be imposed to ensure that attenuation measures are kept in place and are effective throughout the life of the development.'

- 4.1.1 With regard to noise from new mechanical services plant, Appendix 3 of the Local Plan sets out the following:

'A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15 dB if tonal components are present) should be considered as the design criterion).'

4.2 Noise Emission Limits

- 4.2.1 Taking account of the Local Authority criteria as set out within Section 4.1 above, Section 11(1) of BS4142:2014 states:

'Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.'

- 4.2.2 Considering this point, as the daytime background noise levels in table T2 above are only 6dB(A) above 30dB(A) and the night time levels are only 2dB(A) above 30dB(A), we would recommend a plant noise emission limit of 30dB(A), so as to set a pragmatic and achievable limit. This limit should apply 1m from the facade of the nearest residential property, in this case a residential flat on the 1st floor 36 England's Lane.



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- 4.2.3 Noise should not have any tonal or intermittent character that would otherwise attract attention to it.
- 4.2.4 To put the recommended limit of 30dB(A) in context, allowing for a typical loss of 12dB(A) from a partially open window would result in noise levels below 20dB(A) inside any residences exposed to this level of external plant noise.
- 4.2.5 Internal noise levels below 20dB(A) are more than 10dB(A) below the guideline level of $L_{Aeq,8h}$ 30dB suggested in BS8233:2014², as being appropriate for bedrooms to provide suitable conditions for sleeping.
- 4.2.6 Based on the results of the background noise survey set out within table T2 above in addition to the guidance set out above, the following plant noise limits are recommended to apply at the nearest noise sensitive premises, denoted as position AP1 in 206/0332/F1.

Location	Noise Emission Limit, $L_{A,Tr}$ dB (for plant with no distinguishing feature)	
	Daytime (0700-2300 only)	Night time (24-hour)
AP1 – Flat 1, 36 England's Lane, London	30	30

T3 Plant noise emission limits at the nearest residential properties.

- 4.2.7 These limits are to apply to all plant items running simultaneously in the representative time periods, when running at design duty and are to apply at 1m from the outside of nearby residential windows.

5 Plant Noise Assessment

5.1 Proposed Installation

- 5.1.1 The proposed items to be installed with external noise emissions are as follows:

- 2x Condensing Units – Fujitsu AOYG24LBCB

- 5.1.2 One of these units is already installed and running on the site, serving the site. It is proposed to reposition this unit on the roof of the lightwell infill, in addition to installing a duplicate unit for increased capacity.

² British Standard 8233:2014 - Guidance and sound insulation and noise reduction for buildings



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- 5.1.3 As the day and night time mechanical services noise limits set out within table T3 are identical, the proposed scheme has been assessed on the basis that it can run at any time over a 24-hour period.

5.2 Methodology

- 5.2.1 The noise data for the proposed plant items can be seen in the attached plant noise schedule 206/0332/PNS1. The noise data suggests no tonal, intermittent or impulsive characteristics at the assessment position.

- 5.2.2 Noise levels have been calculated at an assessment position representing the nearest and most exposed receivers to the proposed mechanical services. The assessment position is labelled in the attached site plan 206/0332/F1 and is described below.

- AP1: Residential window on the first floor to the rear of 36 England's Lane.

- 5.2.3 The noise levels generated by the mechanical services plant at the assessment position have been calculated by correcting for radiation and distance losses where appropriate.

5.3 Required Mitigation Measures

- 5.3.1 It will be necessary to install an acoustic enclosure around the two condensing units. This enclosure must meet the minimum insertion losses in each octave band as defined in table T4 below.

Enclosure	Insertion Loss, dB at							
	Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
EN-01	13	14	16	16	16	13	10	10

T4 Attenuator insertion loss requirements (enclosure).

- 5.3.2 Enclosure EN-01 must surround both of the external condensers above the light well infill, and can take the form of either a single enclosure for both units, or individual enclosures, depending on architectural constraints. The required enclosure(s) can either be custom made using high performance acoustic louvres or manufactured enclosure(s). Companies such as *Environ*³, *EEC*⁴ or *Sound Planning*⁵ can provide specialist acoustic enclosures such as this which

³ <https://www.environ.co.uk/>

⁴ <http://eec.co.uk/>

⁵ <https://www.soundplanning.co.uk/>



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should meet the necessary requirements. The enclosure(s) must be sized to allow sufficient airflow to the condenser units.

5.3.3 The condensing units must be installed on suitable anti-vibration mounts.

5.4 Assessment Results

5.4.1 With the specified mitigation measures in place, we have assessed the following rating noise levels at the assessment position in T5 below.

Location	Rating Noise Level, L_{A,T_r} dB (Limit)	
	Daytime (0700-2300)	Night Time (2300-0700)
AP1: First floor window, 36 England's Lane	30 (30)	30 (30)

T5 Plant noise emission levels at the nearest residential property.

5.4.2 A summary calculation sheet showing the expected noise levels at the assessment position during both the day and night time hours can be seen in calculation sheet 206/0332/CS1. Detailed calculation sheets can be provided upon request.

6 Conclusions

- 6.1 It is proposed to install mechanical services plant as part of the in-fill of the existing rear light well 36 England's Lane, London NW3 4UE.
- 6.2 This report sets out details and results of a noise survey undertaken at the site in a location representative of the nearest noise sensitive receptor. Plant noise limits have been set in line with Local Authority requirements and guidance from BS 4142:2014+A1:2019.
- 6.3 A noise impact assessment has been conducted of noise from the proposed mechanical services plant items. Acoustic enclosures have been specified in order to sufficiently mitigate noise from the proposed external condensers. The assessment has shown that with the proposed mitigation measures in place, the plant noise limits will be achieved.

■ End of Section



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Glossary of Acoustic Terms

L_{Aeq} :

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq} .

L_{Amax} :

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the “fast” sound level meter response.

L_{A10} & L_{A90} :

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n .

L_{AX} , L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

■ End of Section

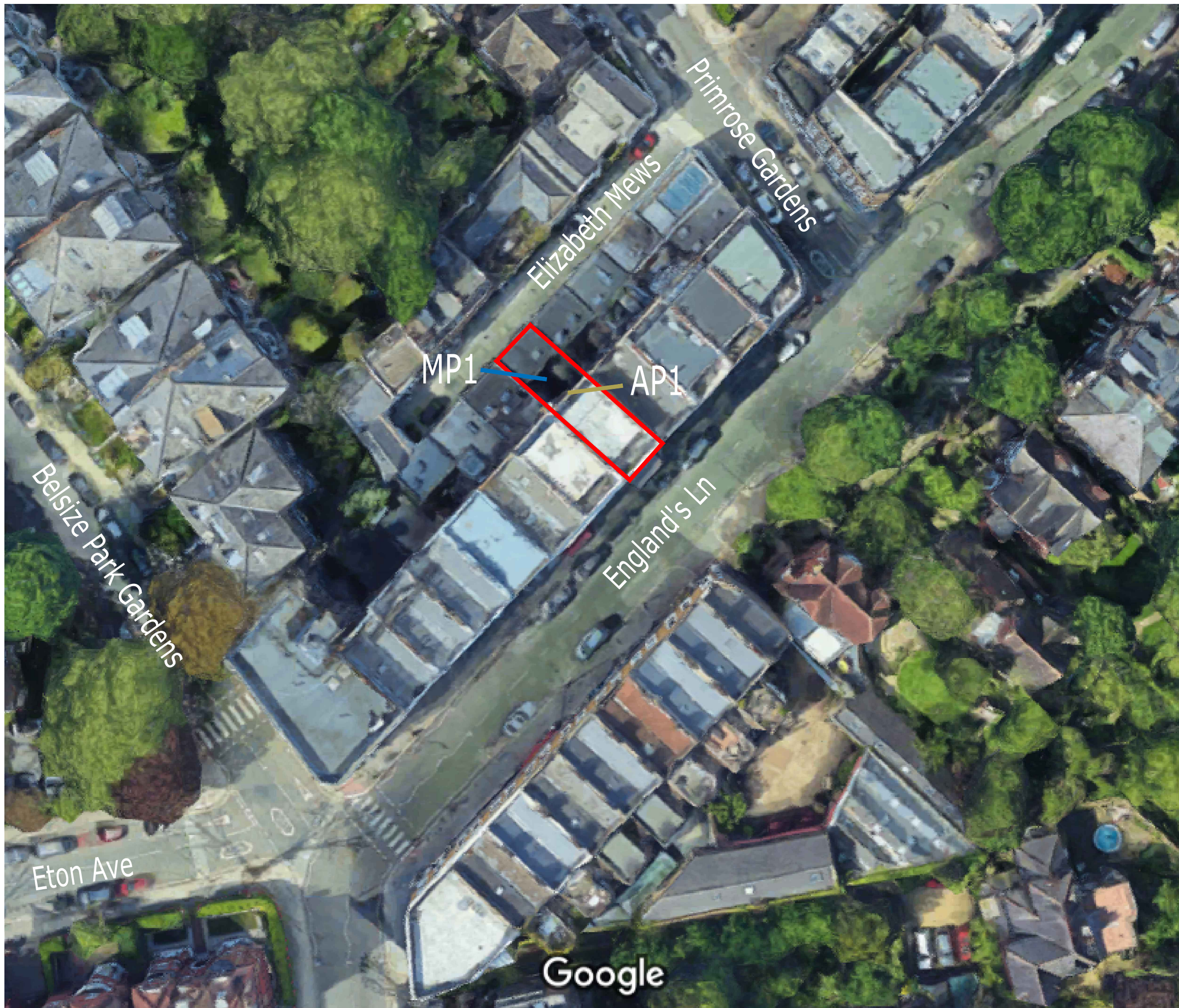


Figure 206/0332/F1

Title:

Figure showing the site location,
the measurement position and
assessment position.

Key:

- Measurement Position
- Assessment Position
- Site Boundary



Project:

36 England's Lane, London

Date:

August 2021

Revision:

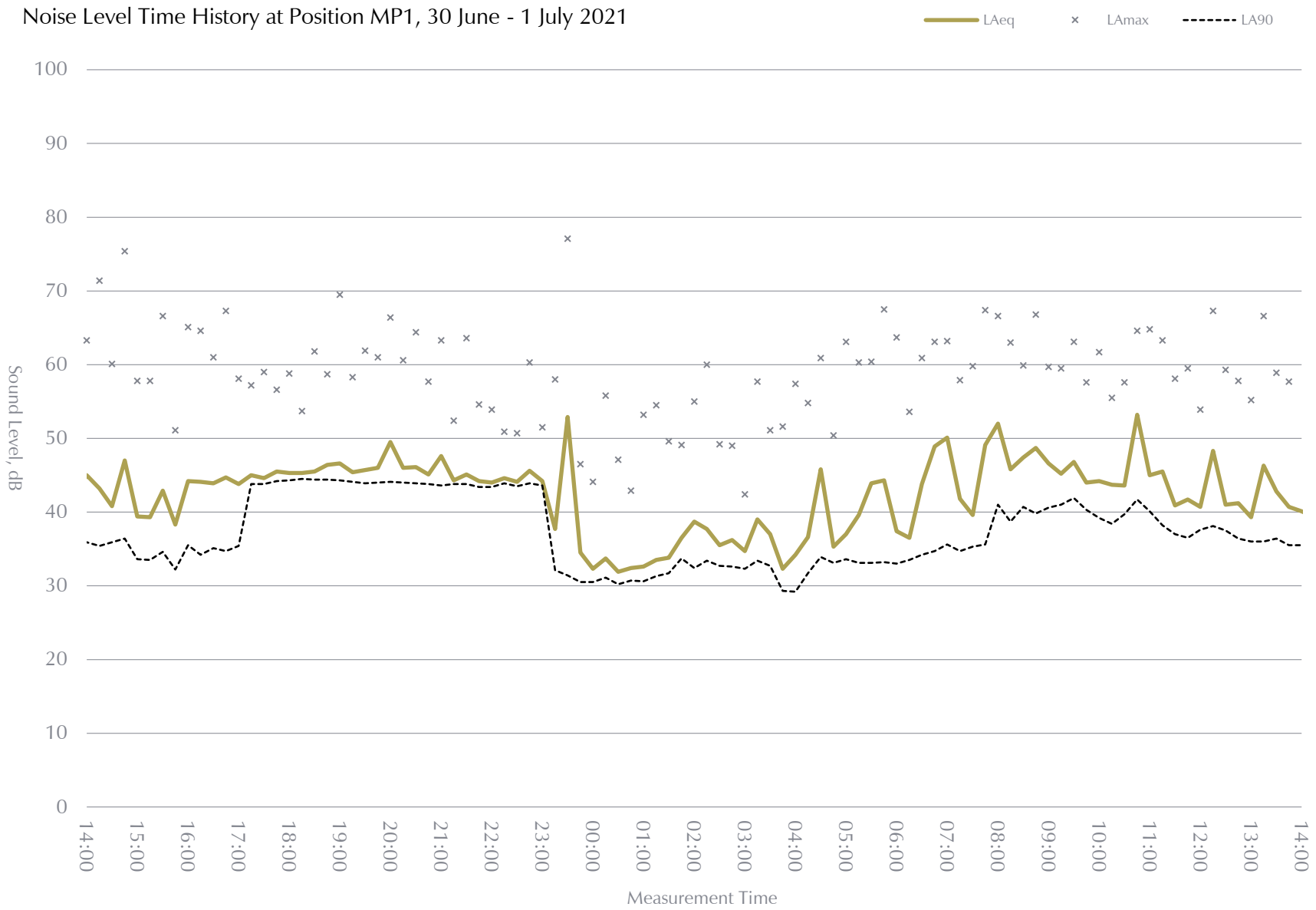
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Scale:

Not to scale



Figure 206/0332/TH01





Schedule of Plant and Air Handling Equipment Sound Levels, dB

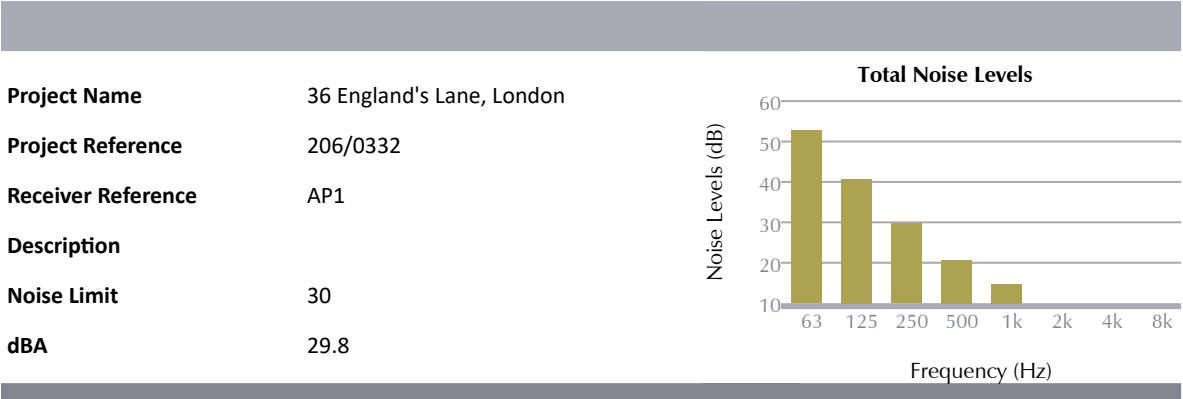
Reference	Description	Data Source ¹	Noise Level Type	Noise Levels (dB)								
				63	125	250	500	1k	2k	4k	8k	
A/C 1	AOYG24LBCB	Man	Sound Pressure, Lp @ 1m	63.0	52.0	42.0	35.0	30.0	22.0	21.0	15.0	
A/C 2	AOYG24LBCB	Man	Sound Pressure, Lp @ 1m	63.0	52.0	42.0	35.0	30.0	22.0	21.0	15.0	

Notes

1 - Man refers to data supplied by the equipment manufacturer or supplier, Emp refers to data calculated using empirical formulae, and Meas refers to data measured by Cole Jarman

Schedule

206/0332/PNS1



Reference	Noise Levels (dB)							
	63	125	250	500	1k	2k	4k	8k
A/C 1	49.7	37.7	26.7	17.7	11.7	2.7	0.7	-5.3
A/C 2	49.7	37.7	26.7	17.7	11.7	2.7	0.7	-5.3

